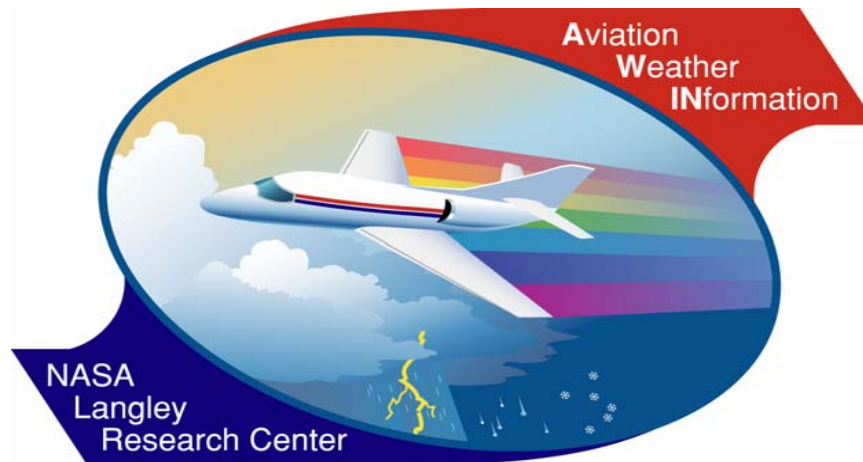
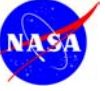




NASA Langley WINN System Operational Assessment

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OBJECTIVES

- ❑ Determine if near real-time weather information presented on the flight deck improves pilot situational awareness of weather.
- ❑ Identify pilot interface issues related to the use of WINN system during test flights.

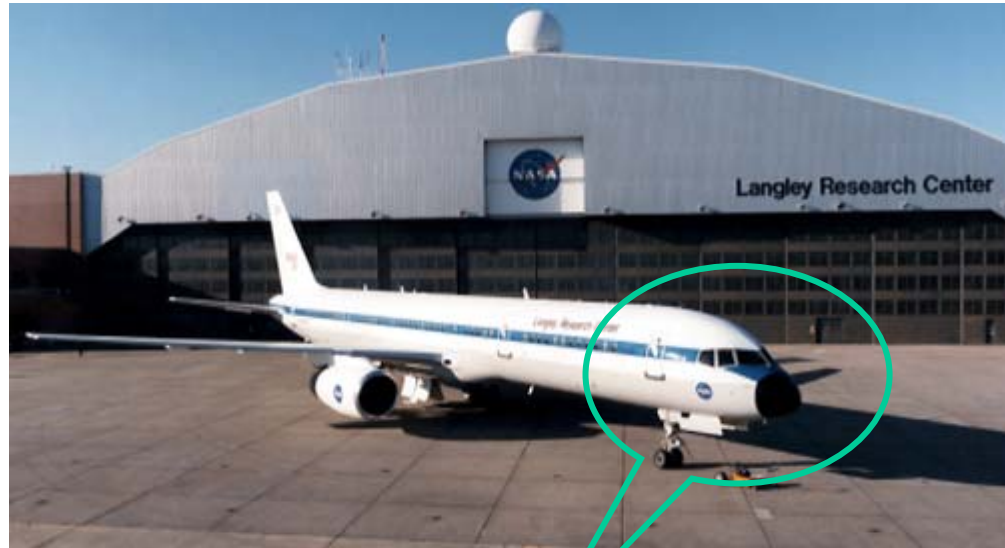


APPROACH

- ☐ NASA pilots used for test subjects (4).
- ☐ Flights conducted on typical airline routes.
- ☐ Test flights scheduled on days of expected convection along the flight path.
- ☐ Video and audio recording of pilot use of WINN.
- ☐ Situational awareness data (verbal & scaled).
- ☐ Post test questionnaire.

Aviation Safety Program

AWIN B-757 Flight Test



**Flight Deck Research
Station (FDRS)**

Conventional B-757

Aviation Safety Program

AWIN B-757 Flight Test









Near-Time Cockpit Weather Display on NASA B-757








Selected Post-Test Questionnaire Results

-  Overall WINN interface intuitive to pilots.
-  Bezel buttons preferable to touch screen to access weather products.
-  Weather forecast products useful in decision making.
-  WINN anticipated to save time and fuel.
-  History feature useful for *strategic* planning.
-  History feature not useful for *tactical* planning.







Selected Post-Test Questionnaire Results

-  *Δ Colors on the display appeared clearly and accurately.*
-  *Δ Entering different altitudes to examine CAT wx product.*
-  *Δ METAR and TAF entry for reporting.*
-
- Δ Squawks corrected on WINN-Lite Display.*



"Six to One; Half Dozen to the Other"

Areas Requiring Further Research

-  Position of display.
-  Ease of determining displayed weather product age.
-  Identification of a precision controller.
-  Ideal time for automated weather updates.



Tactical versus Strategic Wx Replanning

Generally I think, this [system] can obviously provide some very good strategic weather planning information. I still think that for tactical [flying]--deviating around individual cells--or looking out to about 100 miles, I would probably still prefer [using] my aircraft weather radar. But looking down the road, an hour or two down the road, this system could be very helpful.

How best to implement new products (NEXRAD, CAT) with existing systems?



Research Issues Emerging from 757 Flight Test

Color schemes with multiple weather products being shown on the display.

Cloud top information **crucial** for decision making.

NEXRAD: Is the db Reflectivity occurring at **my** cruise level or 10,000 feet below me?

Age of data.

- ✍ Update Rate?
- ✍ How to Display?

Aviation Safety Program

AWIN B-757 Flight Test



Questions and Comments